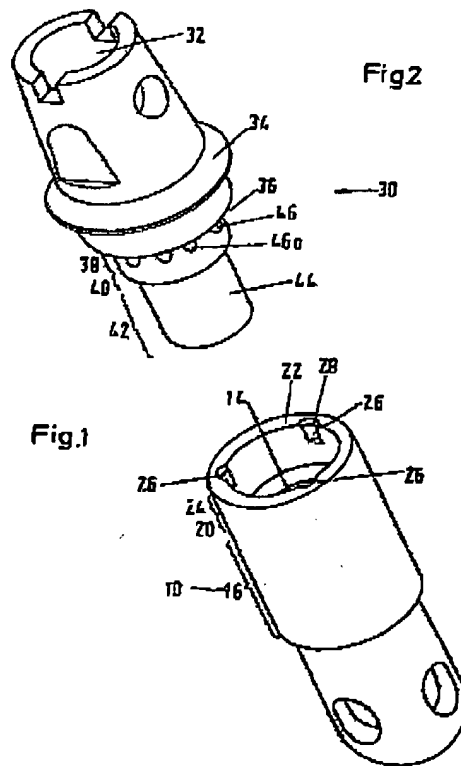


**KIRSH PATENT '904 DESCRIPTION OF FIG. 2 – Note: Radiuses, region lengths and radius ratios are routine design choices; the '904 patent imposes no limits on any of them**

A spacer sleeve 30, shown in FIG. 2, serves in the manner shown in the German patent application 195 09 762.9 as a fastening head for a snug tooth replacement (not shown). The spacer sleeve 30 is provided with an axial longitudinal bore 32 whose inner diameter corresponds to the outer diameter of the implant post (not shown). In addition, it is provided with a circumferential support shoulder 34 for the tooth replacement. Following a shoulder 36 that can be placed on the frontal edge 22 of the basic element 10, which shoulder is fashioned as a circumferential annular shoulder, the spacer sleeve 30 comprises, in the cervical direction, a positive-lock segment 38, a guide segment 40 and a centering segment 42 of a centering collar 44. In the positive-lock region 38, a number of positive-lock cam keys or projections 46, 46a that extend in the axial and radial direction are provided, whereby this number is a whole-number multiple of the number of basic element positive-lock grooves 26. In the representation according to FIG. 2, of the spacer sleeve positive-lock cams 46, 46a provided for this embodiment only four can be seen, whereas their number on the circumference of the positive-lock region 38 can actually be twelve. Each of the spacer sleeve positive-lock cams 46 corresponds in its shape (except for the guide surfaces 28) to the positive-lock grooves 26 of the basic element 10.

During placement of the spacer sleeve 30 into the basic element 10, the centering segment 42 of the centering collar 44 engages in the centering region 16 of the annular opening 14. The guide segment 40 of the spacer sleeve 30 sits with a snug fit in the guide region 20 of the basic element 10.



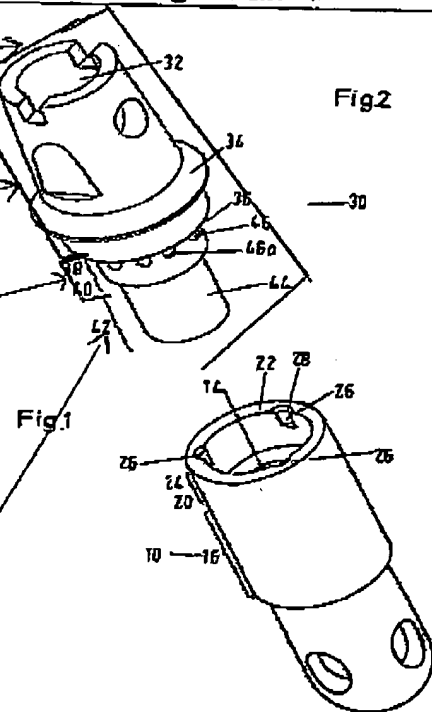
Of the spacer sleeve positive-lock cams 46, the ones are removed—in the manner to be described in more detail below—whose position would not correspond to the basic element positive-lock grooves 26, given a correct alignment of the spacer sleeve 30 on the basic element 10. During the further placement of the spacer sleeve 30, the remaining positive-lock cams, e.g. the positive-lock cam 46, then engage in the basic element positive-lock grooves 26, while the shoulder 36 comes to rest on the frontal edge 22. In this way the spacer sleeve 30 is connected in rotationally secured fashion with the basic element 10. By means of the implant post, which is screwed into the inner threading of the basic element 10, the spacer sleeve 30 can be connected in a fixed manner with the basic element 10.

Here are the charts showing anticipation/obviousness of Claims 37, 52, 56 & 63:

### Independent Claims

### '904 Patent Figs. 1 and 2

37. (Currently amended) (a) A dental abutment for supporting a dental prosthesis on a dental implant; the abutment comprising:
- (b) an upper region comprising a bottom surface;
- (c) an interlock region extending below the bottom surface comprising a non-threaded cylindrical portion and plurality of semi-circular protrusions arranged around a periphery of the cylindrical portion, wherein the cylindrical portion has a first radius and the protrusions have a second radius, a ratio of the first radius to the second radius being between approximately 4:1 and approximately 2:1 and wherein the interlock region has a length measured from the bottom surface that is equal to a first distance; and
- (d) a non-threaded post extending below the interlock region; the post having a length measured from the bottom surface that is equal to a second distance.



### Description of '904 Patent Figs. 1 & 2

The spacer sleeve 30 [this is a prosthodontic component for mating with a dental implant; element (a), Claim 37] is provided with an axial longitudinal bore 32, whose inner diameter corresponds to the outer diameter of the implant post (not shown). In addition, it is provided with a circumferential support shoulder 34 for the tooth replacement. Following a shoulder 36 that can be placed on the frontal edge 22 of the basic element 10, which shoulder is fashioned as a circumferential annular shoulder, [this is the upper region of spacer 30 that extends from the top of spacer 30 distally to shoulder 36; element (b), Claim 37] the spacer sleeve 30 comprises, in the cervical direction, a positive-lock segment 38, [this is an interlock region with three (or more) protrusions arranged around the periphery of the region; element (c), Claim 37] a guide segment 40 and a centering segment 42 of a centering collar 44 [a non-threaded post-extending below the interlock region; the post having a length measured from the bottom surface that is equal to a second distance; element (d), Claim 37]. In the positive-lock region 38, a number of positive-lock cams keys or projections 46, 46a that extend in the axial and radial direction are provided, whereby this number is a whole-number multiple of the number of basic element positive-lock grooves 26. In the representation according to FIG. 2, of the spacer sleeve positive-lock cams 46, 46a provided for this embodiment only four can be seen, whereas their number on the circumference of the positive-lock region 38 can actually be twelve. Each of the spacer sleeve positive-lock cams 46 corresponds in its shape (except for the guide surfaces 28) to the positive-lock grooves 26 of the basic element 10.

## Independent Claims

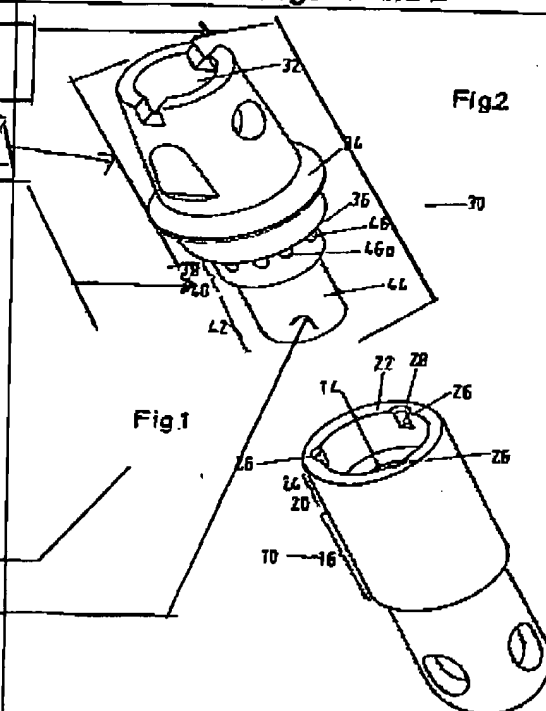
## '904 Patent Figs. 1 and 2

52. (New) (a) A prosthodontic component for mating with a dental implant, comprising:

(b) an upper region comprising a bottom surface;

(c) an interlock region extending below the bottom surface, the interlock region configured to mate with an interlock chamber of a dental implant having a non-threaded cylindrical portion and at least three semi-circular channels arranged around a periphery of the cylindrical portion, wherein the cylindrical portion has a first radius and the channels have a second radius, a ratio of the first radius to the second radius being between approximately 4:1 and approximately 2:1 and wherein the interlock chamber of the dental implant has a length measured from the bottom surface that is equal to a first distance; and

(d) an inner bore extending through the prosthodontic component.



## Description of '904 Patent Figs. 1 &amp; 2

The spacer sleeve 30 [this is a prosthodontic component for mating with a dental implant; element (a), Claim 37] is provided with an axial longitudinal bore 32, whose inner diameter corresponds to the outer diameter of the implant post (not shown). In addition, it is provided with a circumferential support shoulder 34 for the tooth replacement. Following a shoulder 36 that can be placed on the frontal edge 22 of the basic element 10, which shoulder is fashioned as a circumferential annular shoulder, [this is the upper region of spacer 30 that extends from the top of spacer 30 distally to shoulder 36; element (b), Claim 37] the spacer sleeve 30 comprises, in the cervical direction, a positive-lock segment 38, [this is an interlock region with three (or more) protrusions arranged around the periphery of the region; element (c), Claim 37] a guide segment 40 and a centering segment 42 of a centering collar 44 [a non-threaded post-extending below the interlock region; the post having a length measured from the bottom surface that is equal to a second distance; element (d), Claim 37.]. In the positive-lock region 38, a number of positive-lock cams keys or projections 46, 46a that extend in the axial and radial direction are provided, whereby this number is a whole-number multiple of the number of basic element positive-lock grooves 26. In the representation according to FIG. 2, of the spacer sleeve positive-lock cams 46, 46a provided for this embodiment only four can be seen, whereas their number on the circumference of the positive-lock region 38 can actually be twelve. Each of the spacer sleeve positive-lock cams 46 corresponds in its shape (except for the guide surfaces 28) to the positive-lock grooves 26 of the basic element 10.

## Independent Claims

## '904 Patent Figs. 1 and 2

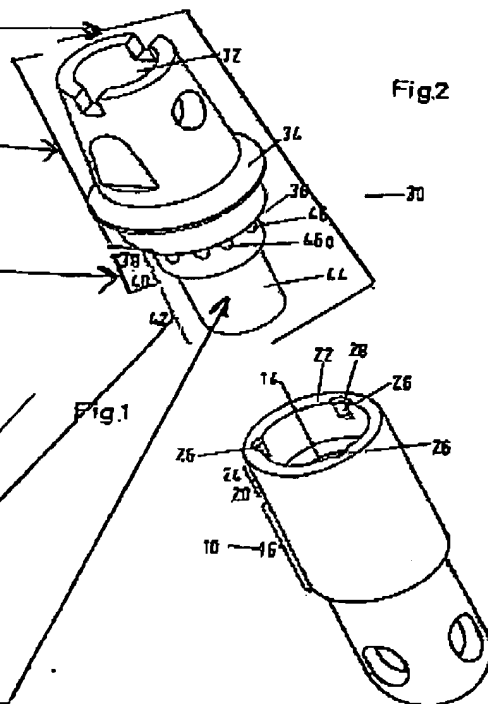
56. (New) (a) A prosthodontic component for mating with a dental implant, the prosthodontic component comprising:

(b) an upper region comprising a bottom surface;

(c) an interlock region extending below the bottom surface comprising a non-threaded cylindrical portion and at least one semi-circular protrusions arranged around a periphery of the cylindrical portion, wherein the cylindrical portion has a first radius and the at least one protrusion has a second radius, a ratio of the first radius to the second radius being between approximately 4:1 and approximately 2:1 and wherein the interlock region has a length measured from the bottom surface that is equal to a first distance;

(d) a non-threaded post extending below the interlock region; the post having a length measured from the bottom surface that is equal to a second distance; and

(e) an inner bore extending through the dental abutment.



## Description of '904 Patent Figs. 1 &amp; 2

The spacer sleeve 30 [this is a prosthodontic component for mating with a dental implant; element (a), Claim 37] is provided with an axial longitudinal bore 32, whose inner diameter corresponds to the outer diameter of the implant post (not shown). In addition, it is provided with a circumferential support shoulder 34 for the tooth replacement. Following a shoulder 36 that can be placed on the frontal edge 22 of the basic element 10, which shoulder is fashioned as a circumferential annular shoulder, [this is the upper region of spacer 30 that extends from the top of spacer 30 distally to shoulder 36; element (b), Claim 37] the spacer sleeve 30 comprises, in the cervical direction, a positive-lock segment 38, [this is an interlock region with three (or more) protrusions arranged around the periphery of the region; element (c), Claim 37] a guide segment 40 and a centering segment 42 of a centering collar 44 [a non-threaded post-extending below the interlock region; the post having a length measured from the bottom surface that is equal to a second distance; element (d), Claim 37.]. In the positive-lock region 38, a number of positive-lock cams keys or projections 46, 46a that extend in the axial and radial direction are provided, whereby this number is a whole-number multiple of the number of basic element positive-lock grooves 26. In the representation according to FIG. 2, of the spacer sleeve positive-lock cams 46, 46a provided for this embodiment only four can be seen, whereas their number on the circumference of the positive-lock region 38 can actually be twelve. Each of the spacer sleeve positive-lock cams 46 corresponds in its shape (except for the guide surfaces 28) to the positive-lock grooves 26 of the basic element 10.

## Independent Claims

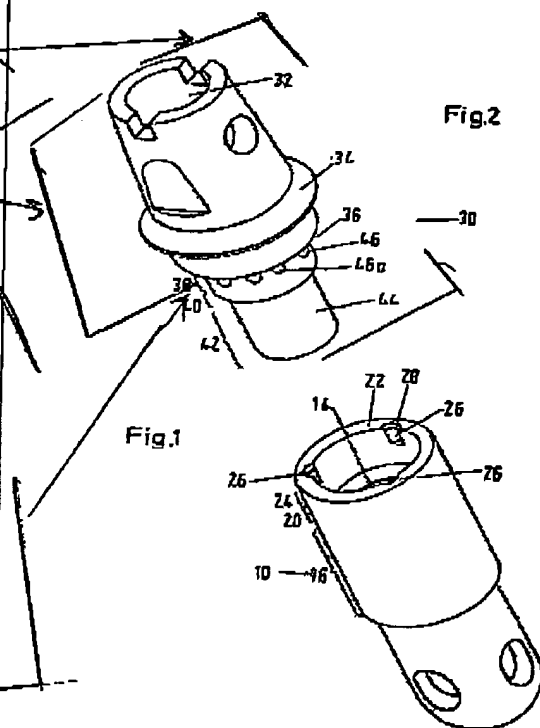
## '904 Patent Figs. 1 and 2

63. (New) (a) A dental abutment for supporting a dental prosthesis on a dental implant, the abutment comprising:

(b) an upper region comprising a bottom surface;

(c) an interlock region extending below the bottom surface comprising a non-threaded cylindrical portion and at least three semi-circular protrusions arranged around a periphery of the cylindrical portion, wherein the cylindrical portion has a first radius and the protrusions have a second radius, a ratio of the first radius to the second radius being between approximately 4:1 and approximately 2:1 and wherein the interlock region has a length measured from the bottom surface that is equal to a first distance;

wherein the bottom surface of the abutment has a third radius and a ratio of the third radius to the second radius is between approximately 5:1 and 4:1.



## Description of '904 Patent Figs. 1 &amp; 2

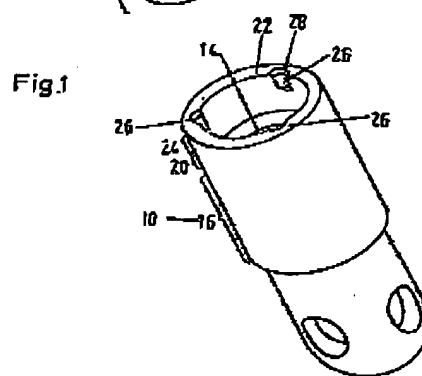
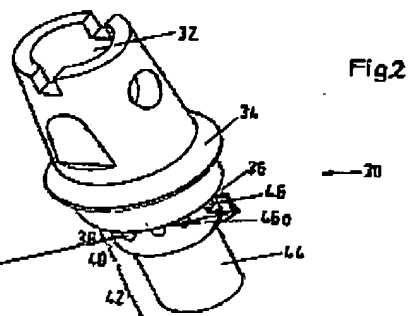
The spacer sleeve 30 [this is a prosthodontic component for mating with a dental implant; element (a), Claim 37] is provided with an axial longitudinal bore 32, whose inner diameter corresponds to the outer diameter of the implant post (not shown). In addition, it is provided with a circumferential support shoulder 34 for the tooth replacement. Following a shoulder 36 that can be placed on the frontal edge 22 of the basic element 10, which shoulder is fashioned as a circumferential annular shoulder, [this is the upper region of spacer 30 that extends from the top of spacer 30 distally to shoulder 36; element (b), Claim 37] the spacer sleeve 30 comprises, in the cervical direction, a positive-lock segment 38, [this is an interlock region with three (or more) protrusions arranged around the periphery of the region; element (c), Claim 37] a guide segment 40 and a centering segment 42 of a centering collar 44 [a non-threaded post-extending below the interlock region; the post having a length measured from the bottom surface that is equal to a second distance; element (d), Claim 37.]. In the positive-lock region 38, a number of positive-lock cams keys or projections 46, 46a that extend in the axial and radial direction are provided, whereby this number is a whole-number multiple of the number of basic element positive-lock grooves 26. In the representation according to FIG. 2, of the spacer sleeve positive-lock cams 46, 46a provided for this embodiment only four can be seen, whereas their number on the circumference of the positive-lock region 38 can actually be twelve. Each of the spacer sleeve positive-lock cams 46 corresponds in its shape (except for the guide surfaces 28) to the positive-lock grooves 26 of the basic element 10.

**Dependent Claims**

38. (Previously presented) The dental abutment according to Claim 37, wherein the ratio of the first radius to the second radius is approximately 3.1.

**Description of '904 Patent Figs. 1 & 2**

The ratio of the radii of protrusions 36 to radius of region 40 is/could be about 3:1

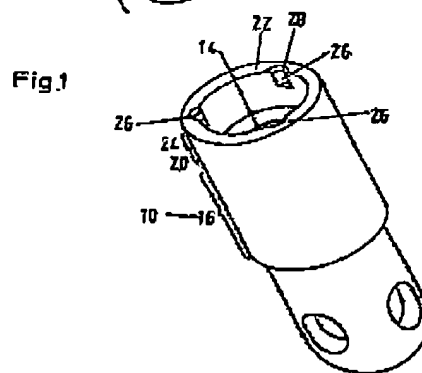
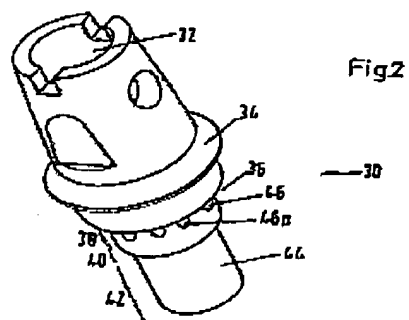
**'904 Patent Figs. 1 and 2**

**Dependent Claims**

39. (Previously presented) The dental implant according to Claim 37, wherein the first distance is greater than 1 millimeter.

**Description of '904 Patent Figs. 1 & 2**

The distance is/could be greater than 1 mm.

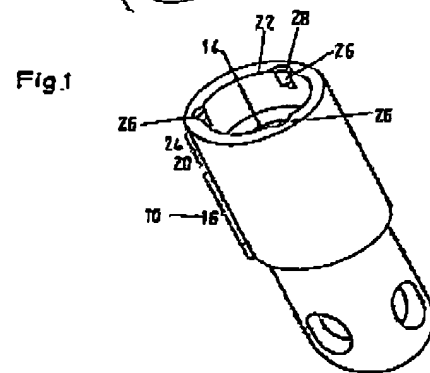
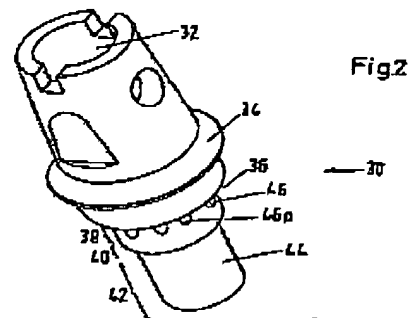
**'904 Patent Figs. 1 and 2**

**Dependent Claims**

40. (Previously presented) The dental abutment accordingly to Claim 37, wherein the abutment further comprises an inner bore.

**Description of '904 Patent Figs. 1 & 2**

Bore 32, Fig. 2, is such an inner bore.

**'904 Patent Figs. 1 and 2**

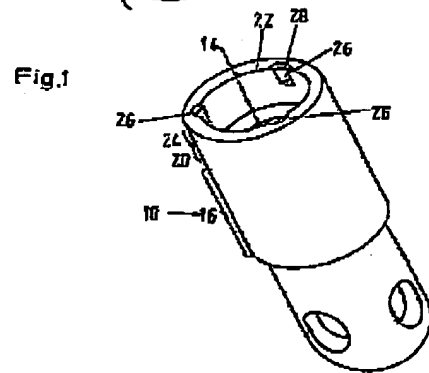
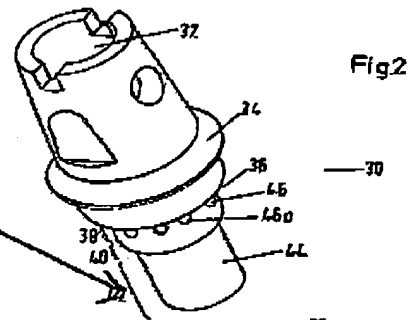


**Dependent Claims**

45. (Previously presented) The dental abutment according to Claim 37, wherein the second distance is greater than approximately 3 millimeters.

**Description of '904 Patent Figs. 1 & 2**

This length is/could be greater than about 3 mm.

**'904 Patent Figs. 1 and 2**

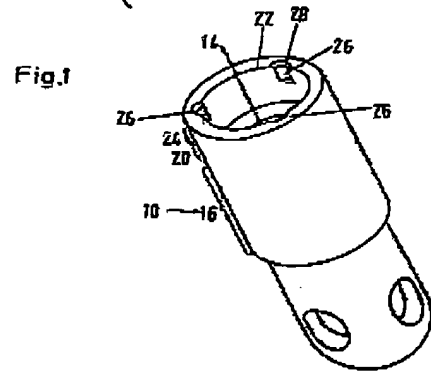
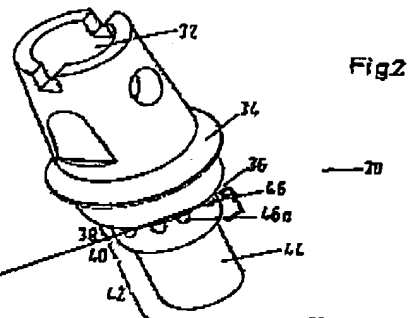
### Dependent Claims

46. (Previously presented) The dental abutment according to Claim 45, wherein the first distance is greater than 1 millimeter.

### Description of '904 Patent Figs. 1 & 2

The distance is/could be greater than 1 mm.

### '904 Patent Figs. 1 and 2



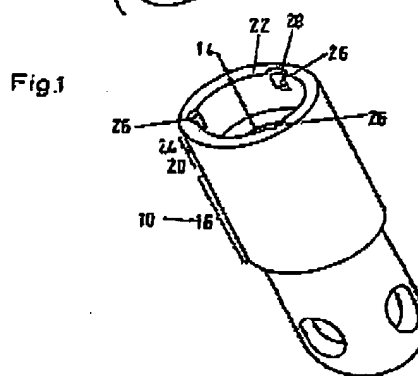
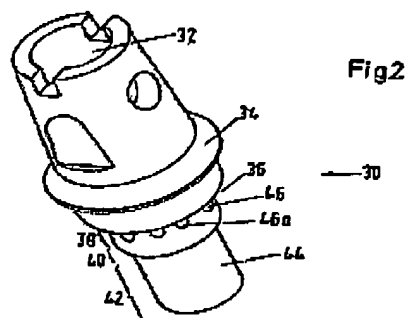
### Dependent Claims

47. (Previously presented) The dental abutment according to Claim 37, wherein the three protrusions are arranged around the perimeter of the interlock region such that each of the protrusions are approximately 120 degrees apart from one another.

### Description of '904 Patent Figs. 1 & 2

In Fig. 2, three of protrusions 36 are about 120° apart from one another.

### '904 Patent Figs. 1 and 2

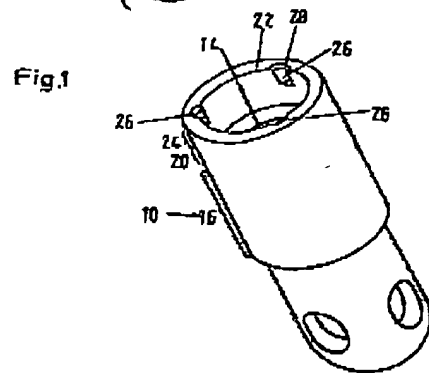
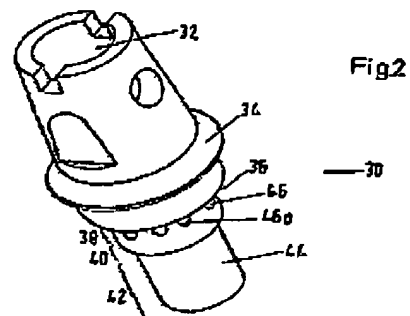


**Dependent Claims**

48. (Previously presented) The dental abutment according to Claim 37, wherein the bottom surface of the abutment has a third radius and a ratio of the third radius to the second radius being between approximately 5:1, and 4:1.

**Description of '904 Patent Figs. 1 & 2**

The ratio of the radius of bottom surface 36 to the radius of region 40 is/could be between about 5:1 and 4:1.

**'904 Patent Figs. 1 and 2**

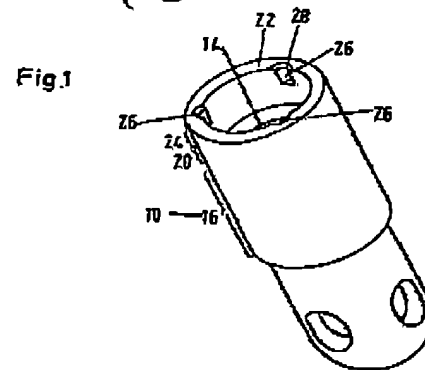
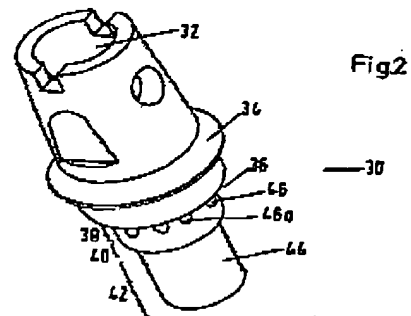
**Dependent Claims**

49. (Previously presented) The dental abutment according to Claim 48, wherein the ratio of the third radius to the second radius is approximately 4.5:1.

**Description of '904 Patent Figs. 1 & 2**

The ratio of the radius of bottom surface 36 to the radius of region 40 is/could be approximately 4.5:1.

/

**'904 Patent Figs. 1 and 2**

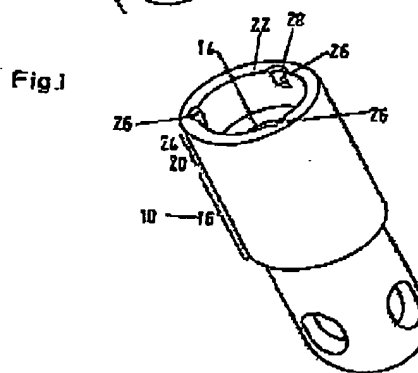
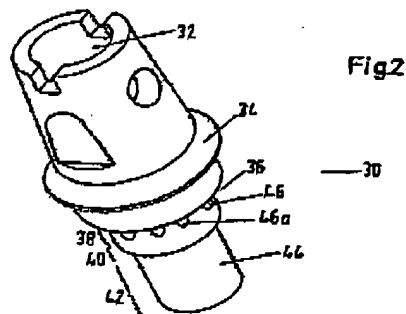
### Dependent Claims

53. (New) The prosthodontic component to Claim 52, wherein the ratio of the first radius to the second radius is approximately 3:1.

### Description of '904 Patent Figs. 1 & 2

The ratio of the radii of protrusions 36 to radius of region 40 is/could be about 3:1

### '904 Patent Figs. 1 and 2



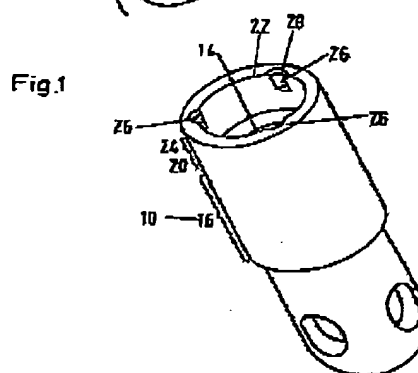
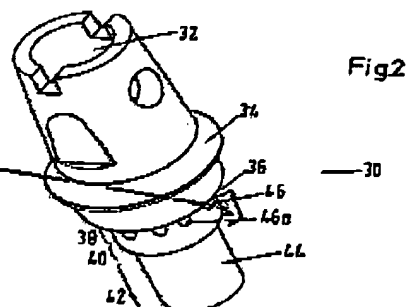
### Dependent Claims

54. (New) The prosthodontic component to Claim 52, wherein the first distance is greater than 1 millimeter.

### Description of '904 Patent Figs. 1 & 2

The distance is/could be greater than 1 mm.

### '904 Patent Figs. 1 and 2

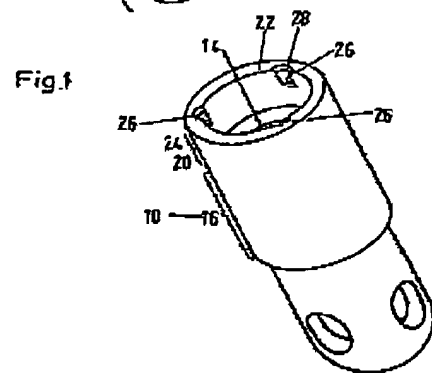
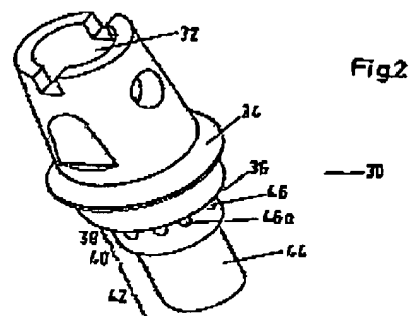


**Dependent Claims**

55. (New) The prosthodontic component according to Claim 52, wherein the three channels are arranged around the perimeter of the interlock chamber such that each of the channels are approximately 120 degrees apart from one another.

**Description of '904 Patent Figs. 1 & 2**

In Fig. 2, three of protrusions 36 are about 120° apart from one another.

**'904 Patent Figs. 1 and 2**



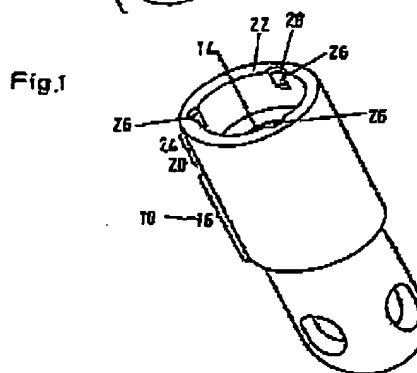
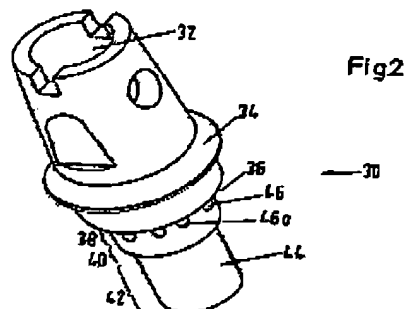
### Dependent Claims

57. (New) The prosthodontic component according to Claim 56, wherein the ratio of the first radius to the second radius is approximately 3:1.

### Description of '904 Patent Figs. 1 & 2

The ratio of the radii of protrusions 36 to radius of region 40 is/could be about 3:1

### '904 Patent Figs. 1 and 2



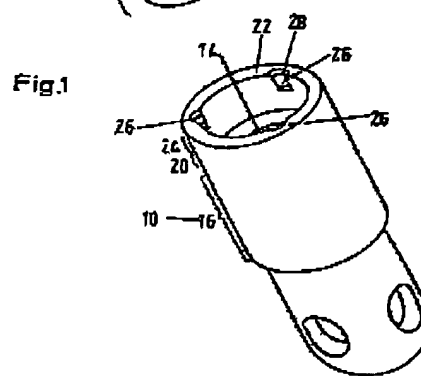
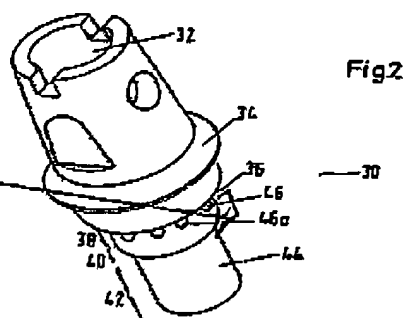
### Dependent Claims

58. (New) The prosthodontic component according to Claim 56, wherein the first distance is greater than 1 millimeter.

### Description of '904 Patent Figs. 1 & 2

The distance is/could be greater than 1 mm.

### '904 Patent Figs. 1 and 2

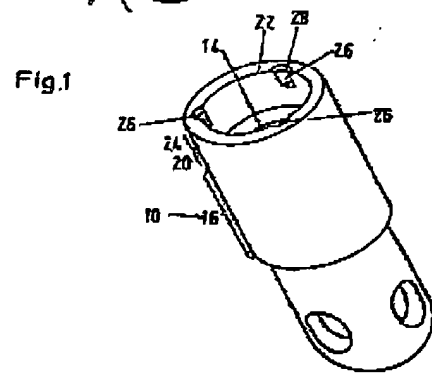
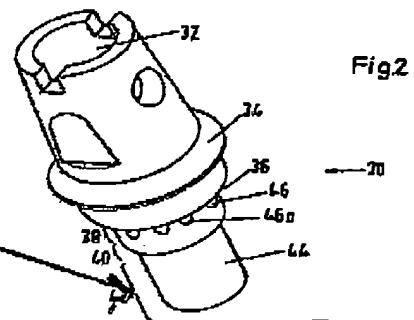


**Dependent Claims**

59. (New) The prosthodontic component according to Claim 56, wherein the second distance is greater than approximately 3 millimeters.

**Description of '904 Patent Figs. 1 & 2**

This length is/could be greater than about 3 mm.

**'904 Patent Figs. 1 and 2**

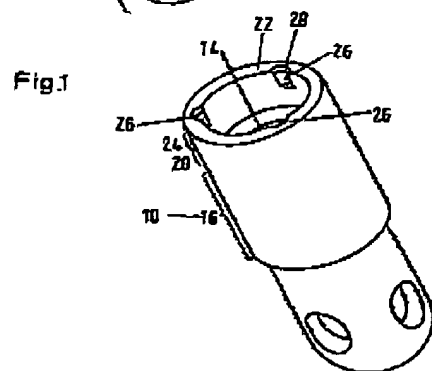
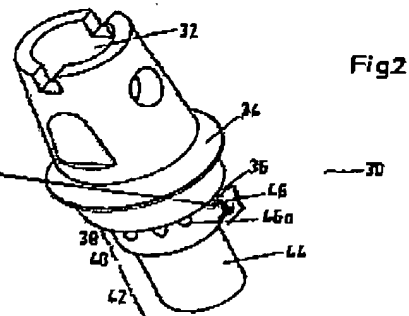
### Dependent Claims

60. (New) The prosthodontic component to Claim 59, wherein the first distance is greater than 1 millimeter.

### Description of '904 Patent Figs. 1 & 2

The distance is/could be greater than 1 mm.

### '904 Patent Figs. 1 and 2

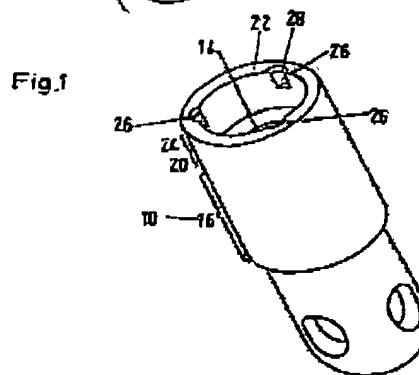
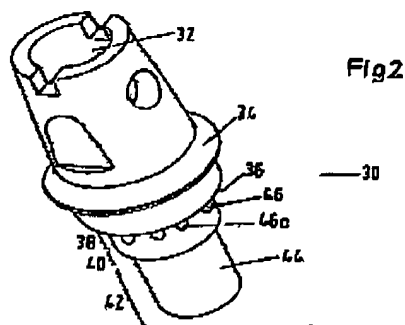


**Dependent Claims**

61. (New) The prosthodontic component to Claim 56, wherein the bottom surface of the prosthodontic component has a third radius and a ratio of the third radius to the second radius is between approximately 5:1, and 4:1.

**Description of '904 Patent Figs. 1 & 2**

The ratio of the radius of bottom surface 36 to the radius of region 40 is/could be between about 5:1 and 4:1.

**'904 Patent Figs. 1 and 2**

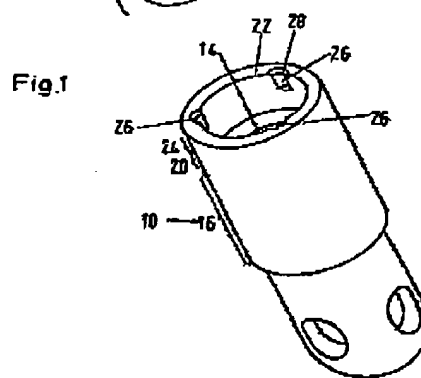
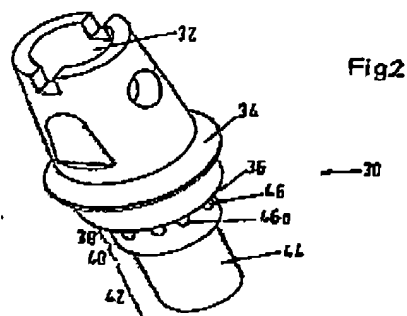
### Dependent Claims

62. (New) The prosthodontic component according to Claim 61, wherein the ratio of the third radius to the second radius is approximately 4.5:1.

### Description of '904 Patent Figs. 1 & 2

The ratio of the radius of bottom surface 36 to the radius of region 40 is/could be approximately 4.5:1.

### '904 Patent Figs. 1 and 2

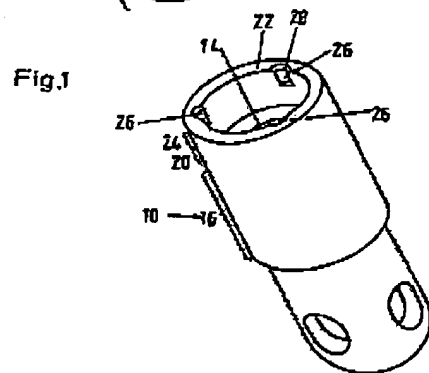
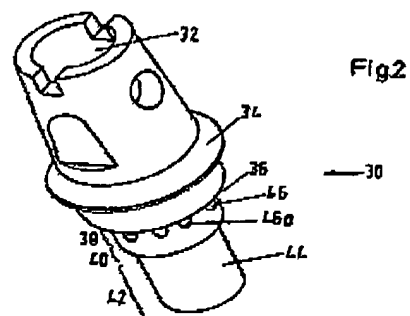


**Dependent Claims**

64. (New) The dental abutment according to Claim 63, wherein the ratio of the first radius to the second radius is approximately 3:1.

**Description of '904 Patent Figs. 1 & 2**

The ratio of the radii of protrusions 36 to radius of region 40 is/could be about 3:1

**'904 Patent Figs. 1 and 2**

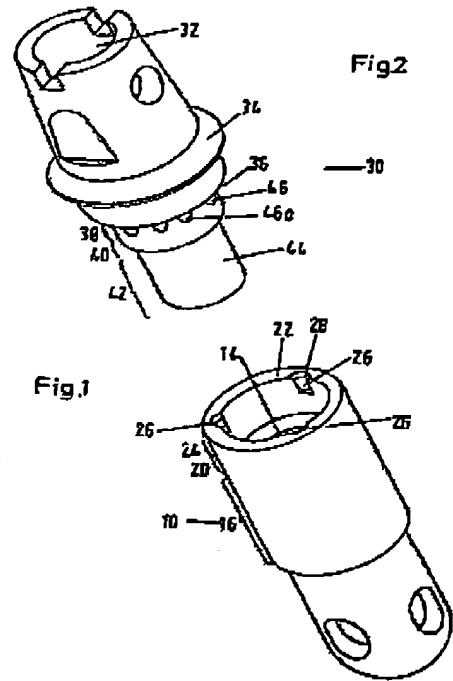
### Dependent Claims

65. (New) The dental abutment according to Claim 63, wherein the abutment further comprises an inner bore.

### Description of '904 Patent Figs. 1 & 2

Bore 32, Fig. 2, is such an inner bore.

### '904 Patent Figs. 1 and 2





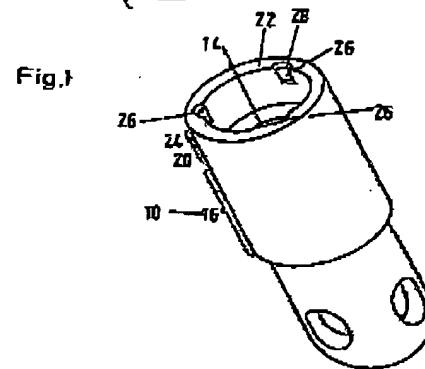
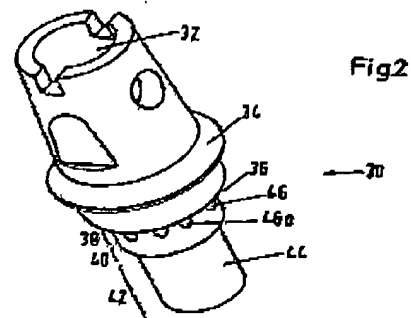
### Dependent Claims

86. (New) The dental abutment according to Claim 63, wherein the at least three protrusions are arranged around the perimeter of the interlock region such that each of the protrusions are approximately 120 degrees apart from one another.

### Description of '904 Patent Figs. 1 & 2

In Fig. 2, three of protrusions 36 are about 120° apart from one another.

### '904 Patent Figs. 1 and 2



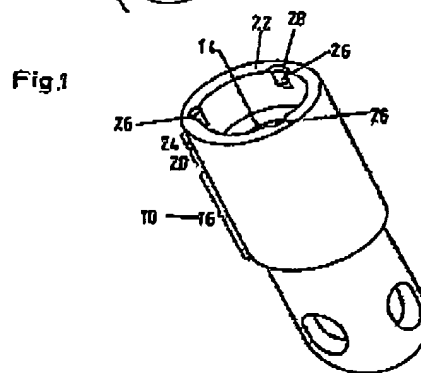
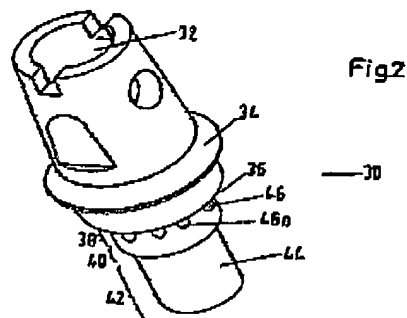
### Dependent Claims

67. (New) The dental abutment according to Claim 63, wherein the ratio of the third radius to the second radius is approximately 4.5:1.

### Description of '904 Patent Figs. 1 & 2

The ratio of the radius of bottom surface 36 to the radius of region 40 is/could be approximately 4.5:1.

### '904 Patent Figs. 1 and 2



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Respectfully submitted,

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